



Docket No. 47253-00004  
P200000081 US JPB/SHA

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: )  
Cecilia BRANDEL et al. )  
Serial No.: 09/827,280 ) Examiner: Not Yet Assigned  
Filed: 04/05/01 ) Group Art Unit: 2641

For: A METHOD OF ESTIMATING THE PITCH OF A SPEECH SIGNAL USING AN  
AVERAGE DISTANCE BETWEEN PEAKS, USE OF THE METHOD, AND A DEVICE  
ADAPTED THEREFOR

BOX Post Allowance (Amendment)  
Assistant Commissioner for Patents  
Washington, D.C. 20231

CERTIFICATE OF MAILING	
I hereby certify that this correspondence is being deposited postage paid with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231	
on June 20, 2001	
Signature	

Dear Sir:

PRELIMINARY AMENDMENT

IN THE SPECIFICATION

Please delete the text, on page 19 of the Application as originally filed, from the word ABSTRACT through the sentence that reads "Fig. 1 should be published." Please add a new page 20 with the following text thereon:

ABSTRACT

A method of estimating the pitch of a speech signal (2) comprises the steps of dividing the speech signal into segments, calculating for each segment a conformity function, and detecting peaks in the conformity function. The method further comprises the steps of estimating an average distance between said peaks, and using the estimated average distance as an estimate of the pitch. In this way a method less complex than prior art methods, and thus suitable for small digital signal processors, is provided. The method also avoids the pitch halving situation. When the method is based on the fact that the identified peaks in the conformity function show a periodic behavior and that the true pitch period actually corresponds to the distance between the peaks, a simpler algorithm is achieved which provides the true pitch period independent on the occurrence of pitch halving, pitch doubling, etc. A similar device is also provided.


REMARKS

A clean copy of new pages 19 and 20 is included without markings. In addition, a marked-up copy showing all the changes on pages 19 and 20 is attached hereto. No new matter has been added. These amendments are being made in response to the Notice to File Corrected Application Papers mailed May 18, 2001.

Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 10-0447, and please credit any excess fees to such deposit account.

Respectfully submitted,

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## ABSTRACT

A method of estimating the pitch of a speech signal (2) comprises the steps of dividing the speech signal into segments, calculating for each segment a conformity function, and detecting peaks in the conformity function. The method further comprises the steps of estimating an average distance between said peaks, and using the estimated average distance as an estimate of the pitch. In this way a method less complex than prior art methods, and thus suitable for small digital signal processors, is provided. The method also avoids the pitch halving situation. When the method is based on the fact that the identified peaks in the conformity function show a periodic behavior and that the true pitch period actually corresponds to the distance between the peaks, a simpler algorithm is achieved which provides the true pitch period independent on the occurrence of pitch halving, pitch doubling, etc. A similar device is also provided.

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Marked-up copy showing changes to page 19:

A method of estimating the pitch of a speech signal using an average distance between peaks, use of the method, and a device adapted therefor.

[ABSTRACT

A method of estimating the pitch of a speech signal (2) comprises the steps of dividing the speech signal into segments, calculating for each segment a conformity function, and detecting peaks in the conformity function. The method further comprises the steps of estimating an average distance between said peaks, and using the estimated average distance as an estimate of the pitch. In this way a method less complex than prior art methods, and thus suitable for small digital signal processors, is provided. The method also avoids the pitch halving situation. When the method is based on the fact that the identified peaks in the conformity function show a periodic behavior and that the true pitch period actually corresponds to the distance between the peaks, a simpler algorithm is achieved which provides the true pitch period independent on the occurrence of pitch halving, pitch doubling, etc. A similar device is also provided.

Fig. 1 should be published.]

Marked-up copy showing new page 20:

ABSTRACT

A method of estimating the pitch of a speech signal (2) comprises the steps of dividing the speech signal into segments, calculating for each segment a conformity function, and detecting peaks in the conformity function. The method further comprises the steps of estimating an average distance between said peaks, and using the estimated average distance as an estimate of the pitch. In this way a method less complex than prior art methods, and thus suitable for small digital signal processors, is provided. The method also avoids the pitch halving situation. When the method is based on the fact that the identified peaks in the conformity function show a periodic behavior and that the true pitch period actually corresponds to the distance between the peaks, a simpler algorithm is achieved which provides the true pitch period independent on the occurrence of pitch halving, pitch doubling, etc. A similar device is also provided.

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